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# Relationship between Technology Use and Eating Behavior

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## ABSTRACT

**Objectives:** The aim of this study was to investigate the relationship between the use of technological devices and eating behavior.

**Methods:** The study sample consisted of participants who applied to the Nutrition and Diet Policlinic in a private medical center in Istanbul between March and April 2019. The data were obtained using the data collection form, Eating attitude test, and Technology addiction scale.

**Results:** There were 206 participants in this study. While the frequency of technology addiction in females was 125 (65.4%), it was 66 (34.6%) in males ( $p=0.010$ ). It was found that 69 (36.1%) people who were technology addicts had impaired eating behavior, and 122 (63.9%) people had normal eating behavior ( $p=0.828$ ).

**Conclusion:** As a result, there was no statistically difference between the normal and eating disorder groups according to their technology use. On the other hand, technology addiction and eating disorder were more common among women, while technology addiction was more common in obese individuals. According to these findings, it was concluded that it would be useful to plan initiatives against technology addiction, especially for women and obese individuals.

**Keywords:** Technology, eating, obesity, feeding and eating disorders, body mass index



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## INTRODUCTION

Conscious nutrition attracts most of society today.<sup>[1]</sup> In the past 10 years, thanks to technology, there has much news in the media on health, nutrition, and diseases. Media is one of the most effective option for food selection, but unfortunately, media tools can give false information that is not based on evidence.<sup>[2]</sup> As consumers cannot identify the correct source of information, they can make wrong food choices. The explanation given by famous people, who do not have any solid basis but have high credibility, can make consumers doubt even the simplest and basic nutrients such as egg, bread, and milk. All explanation about food causes many irreversible risks related to health.<sup>[1]</sup>

With advancements in technology, people can easily plan and perform their daily activities and communicate and interact with others in many ways. In the information age, the technology that constantly evolves creates a positive impact on our lives while imparting negative effects sometimes.<sup>[3]</sup> Some research has identified that using technology uncontrollably and excessively causes serious problems to individuals' health.<sup>[4–6]</sup> With the unconscious and inconsistent use of technology, addiction to technology arises, which is an important problem.<sup>[7]</sup> Problematic technology use, which shows negative effects on social life and working life, is explained as a

comprehensive syndrome in which symptoms are revealed in cognitive and behavioral aspects. One study found a positive correlation between the time spent on the Internet by adolescents and problematic internet use.<sup>[8]</sup>

It is portrayed in the media that weakness is ideal, and in this way, it is reflected that it has results such as acceptance and success in society.<sup>[9]</sup> Creating this perception can cause eating behavior disorders such as dieting, regretting and vomiting, and using laxatives or diuretics. The impact of the media is so powerful that it can even change the perception of healthy people that they have problems with eating behaviors. These effects are more common in adolescents, especially girls. The desire to compare themselves with others triggers problematic eating behavior in these adolescents. The representation of weakness in the media as ideal brings, along with eating disorders, depression, unhappiness, anxiety, guilt, embarrassment, and self-confidence problems.

Eating behavior is important in terms of social, emotional, cognitive, and motor development and is caused by environmental factors.<sup>[10]</sup> Eating behavior can change according to the family's eating habits, and social, environmental, and psychological status of adolescents. Eating disorders are seen in all age groups and gender, but the most at risk are young girls and women.<sup>[11]</sup> Eating disorders are psychiatric disorders that occur due to permanent damage related to eating behavior and affect physical and psychological functions significantly. Eating disorders range from mild abnormal symptoms to chronic illness, and they can be life-threatening.<sup>[12]</sup> Eating disorders usually begin during adolescence, and susceptibility to eating disorders is more common among women. The prevalence of life-long eating disorders is between 1% and 4%, and this rate is around 1%–3% in Turkey.<sup>[13]</sup> The Diagnostic and Statistical Manual of Mental Disorders–V (DSM-V) criteria, published by the American Psychiatric Association in 2013, describes eight types of eating disorders. These disorders are pica, rumination disorder, restrictive food intake disorder, anorexia nervosa, bulimia nervosa, binge-eating disorder, other specified feeding or eating disorder, and unspecified feeding or eating disorder.<sup>[14]</sup>

Obesity is a medical condition in which an excessive amount of adipose tissue accumulates under the skin and around the organ, which may impair health. Excess body fat damages multiple organ systems through thrombogenic, atherogenic, oncogenic, hemodynamic, and neuro-humoral mechanisms. Numerous epidemiological studies have shown relationships between various diseases such as obesity and diabetes mellitus, heart disease, and a few types of cancer.<sup>[15–18]</sup> Obesity has also been shown to have

negative effects on the psychosocial and economic aspects of life.<sup>[19]</sup> According to the obesity report published by the World Health Organization (WHO) in April 2020, 1.9 billion adults are overweight and obese, and 200 million people die every year due to obesity-related diseases.<sup>[20,21]</sup>

The amount of energy we spend in daily life decreases due to the advancement in technology. Time spent on television, computer, and other technological devices pushes both adults and young people to a sedentary lifestyle.<sup>[10]</sup> It is reported that the increasing use of information and communication technologies is associated with increasing obesity rates. Problematic use of the internet leads to less physical activity, leading to obesity. In addition, it has been reported that individuals with internet addiction have a high level of irregular diet compared with control groups. Changes in eating attitudes related problematic Internet use may cause obesity indirectly.<sup>[22]</sup>

The aim of this study was to investigate the relationship between technology use, eating behavior, and body mass index (BMI).

## METHOD

This research was carried out with individuals who applied to the Nutrition and Diet Policlinic in a private medical center in Istanbul between March 2019 and April 2019. People who did not have any disease, who were between the ages of 15 and 65 years, who used technological devices, and who could understand and speak Turkish were included in the study. The sample of this research consisted of 206 participants. All participants were included in the study as they met the inclusion criteria.

The sociodemographic data form was developed by the researchers using the literature to collect demographic characteristics data of the patients. The height and weight of the participants were measured, and BMI values were calculated by researchers. The BMI was calculated as body weight (kg)/height (m<sup>2</sup>). Measurements were made according to the WHO classification.<sup>[23]</sup>

The eating attitude test (EAT-26), which used 26 questions out of the 40 questions, was used to determine the eating attitudes and behaviors of the participants. EAT-26 is the short form of the scale developed by Garner and Grafinkel in 1979, and its validity and reliability in Turkish were done by Savaşır and Erol in 1989.<sup>[24–26]</sup> The cutoff value of the scale is 20 points. Individuals with a score of 20 or above are called individuals with “impaired eating behavior,” while those scoring below 20 are considered individuals with “normal eating behavior.”<sup>[27]</sup>

The technology addiction scale (TAS) developed by Aydın was used to measure “social network addiction,” “instant messaging addiction,” “online game addiction,” and “web-site addiction” of the participants of the study. While calculating these subscales, a scoring system was developed with arithmetic mean, with the highest and the lowest scores being 30 and 6, respectively.<sup>[3]</sup> The highest score for TAS can be 120 and the lowest score can be 24. At the end of the whole scale, those who were in the range of 0–24 points were “not dependent”; those who were in the 25–48 point range were “low dependent”; those who were in the range of 49–72 points were “moderately dependent”; those who were in the range of 73–96 points were “very dependent”; and those who were in the range of 97–120 points were categorized as “fully dependent.”<sup>[7]</sup>

### Statistical Analysis

All analyses were made using SPSS-23 (Statistical Package for the Social Sciences) software. Descriptive data were evaluated as frequency, percentage, mean, and standard deviation. The distribution of continuous variables was evaluated using the Kolmogorov–Smirnov and the Shapiro–Wilk test. The relationships between categorical variables were analyzed using the Chi-squared test. The statistical significance level was taken as  $p < 0.05$ .

## RESULTS

The mean age of the total 206 participants was  $32.3 \pm 12.2$  years, and the mean BMI values were  $25.1 \pm 5.5$  kg/m<sup>2</sup>. The sociodemographic features of the participants are summarized in Table 1.

Technological addiction was found in 191 (92.7%) of the participants. When the gender and BMI values of technology addiction were compared, a statistically significant difference was found between the groups ( $p < 0.001$  and  $p < 0.001$ , respectively). The frequency of impaired eating behavior was 76 (36.9%). When the gender and BMI values of the individuals with impaired eating behavior were compared, a statistically significant difference was found between the groups ( $p < 0.001$  and  $p < 0.001$ , respectively). The distribution of gender, age, and BMI groups according to technology addiction and impaired eating behavior are summarized in Table 2.

When eating behavior status was examined according to the technology addiction status, there was no statistically significant difference between normal and impaired eating behavior groups ( $p = 0.828$ ). The distribution of eating disorder behavior status according to technology dependency status is summarized in Table 3.

**Table 1.** Sociodemographic features of the participants

	Mean±SD
Age (years)	32.3±12.2
Height (cm)	168.1±8.9
Weight (kg)	71.0±17.1
BMI (kg/m <sup>2</sup> )	25.1±5.5
	<b>n (%)</b>
Profession	
Housewife	18 (8.8)
Retired	2 (0.9)
Self-employment	9 (4.4)
Teacher	31 (15.0)
Health employee	18 (8.7)
Student	66 (32.0)
Other	62 (30.2)
Working status	
Part-time	20 (9.7)
Full-time	96 (46.7)
Not working	90 (43.6)
Education status	
Primary school	4 (1.9)
Secondary school	8 (3.9)
High school	65 (31.6)
University	119 (57.8)
Postgraduate	10 (4.8)
Mother's educational status	
Primary school	94 (45.7)
Secondary school	35 (16.9)
High school	44 (21.4)
University	22 (10.7)
Postgraduate	11 (5.3)
Father's educational status	
Primary school	62 (30.2)
Secondary school	30 (14.5)
High school	54 (26.2)
University	48 (23.3)
Postgraduate	12 (5.8)
Income status	
1699 TL and below	15 (9.8)
1700-2499 TL	43 (28.3)
2500-5499 TL	94 (61.9)

BMI: Body mass index; SD: Standard deviation; TL: Turkish liras.

## DISCUSSION

In this study, the relationship between technology use, eating behavior, and BMI has been investigated. While the BMI values of technology addicts and nonaddicts were similar, only the BMI values of individuals who were technology

**Table 2.** Distribution of gender, age, and body mass index groups according to technology addiction and impaired eating behavior

	Technology Addiction			Impaired Eating Behavior		
	Absent (n=15)	Present (n=191)	p	Absent (n=130)	Present (n=76)	p
Gender						
Female	9 (60.0)	125 (65.4)	0.010	47 (36.1)	53 (71.7)	0.001
Male	6 (30.0)	66 (34.6)		83 (63.9)	23 (28.3)	
Age groups						
<25 years	4 (26.6)	76 (39.8)	0.069	54 (41.5)	36 (47.4)	0.744
25–40 years	3 (20.0)	65 (34.0)		42 (32.3)	21 (27.6)	
>40 years	8 (53.4)	50 (26.2)		34 (26.2)	19 (25.0)	
BMI groups						
<18.5 kg/m <sup>2</sup>	2 (13.2)	13 (6.8)	0.001	12 (9.2)	3 (4.0)	0.001
18.5–24.9 kg/m <sup>2</sup>	3 (20.0)	90 (47.1)		45 (34.6)	35 (46.0)	
25–29.9 kg/m <sup>2</sup>	5 (33.4)	52 (27.2)		56 (43.1)	20 (26.3)	
≥30 kg/m <sup>2</sup>	5 (33.4)	36 (18.9)		17 (13.1)	18 (23.7)	

BMI: Body mass index.  
Data are presented as n(%).  
Chi-Square test.

addicts were compared, and a statistically significant difference was found between the groups. The proportion of those with normal body weight was higher than those with other BMI values. In another study conducted in 2013, it was reported that long-term internet use and video game play were associated with high BMI values in men, and this was not observed in female participants.<sup>[28]</sup> Another study conducted with 358 elementary school students found that the level of internet addiction of the participants also increased when the BMI values increased.<sup>[29]</sup> In Australia, a study was conducted to examine the time spent by 2650 adults on the internet and on the computer and whether they were overweight or obese.<sup>[30]</sup> It was found that people who use computers and the internet more often than

those who do not use any computer or internet in their spare time are more likely to be overweight or obese. It is thought that this difference is due to the insufficient distribution of demographic characteristics of the people included in the study.

In this study, it was observed that the technology addiction status of individuals with normal and impaired eating behavior was similar; it has been determined that most of the groups with and without technology addiction do not have impaired eating behavior. In a similar study conducted in China, it was aimed to investigate the psychopathological causes underlying internet addiction with a total of 1199 people aged between 12 and 25 years, who studied at sec-

**Table 3.** Distribution of eating disorder behavior status according to technology dependency status

	Technology Addiction Scale		p
	Non-technology addict (n=15)	Technology addict (n=191)	
Eating attitude test			
Impaired eating behavior	5 (33.3)	69 (36.1)	0.828
Normal eating behavior	10 (66.7)	122 (63.9)	

Data are presented as n (%).  
Chi-squared test.

ondary school and university.<sup>[31]</sup> EAT-26 and eating disorder inventory were used to determine eating behavior in the study. According to the results of the study, it was observed that students with internet addiction had a higher eating disorder problems than the control group.

In this study, when the genders of technology addicts were compared, a statistically significant difference was found between the groups, and the frequency of females was higher than that of males. Berber Çelik et al. investigated the relationship between problematic internet use and eating behavior with 314 students studying at Karadeniz Technical University and found no significant relationship between problematic internet use and gender.<sup>[32]</sup> In another study, men with internet addiction were found to be more in numbers than the nonaddicted.<sup>[31]</sup> These results in the literature are different from those in our study. It is thought that these results, which differ from our study, may result from the difference in the number of participants.

In our study, while the frequency of females with impaired eating behavior was higher than males, there was no difference between the BMI values of females with normal and impaired eating behaviors. In a study investigating the effect of gender and body weight status on eating behavior disorders and eating addiction among university students, it was found that eating disorders and eating addiction were more common in women than in men.<sup>[33]</sup> These results in the literature are compatible with those of our study.

In addition, when BMI values of all participants with impaired eating behavior were compared, it was found that people with normal body weight were higher in number than those in the other BMI range. In the literature, studies examining the relationship between eating disorder and BMI have also been found. In a study conducted in Turkey on 900 college students between the ages of 17 and 23 years, EAT-40 and orthorexia nervosa-15 (ON-15) scales were used to examine the relationship between eating disorder and ON and gender and BMI.<sup>[34]</sup> The results showed that there is no relationship between EAT-40 and gender and BMI values. In addition, although the number of women with ON is higher than men, there was no relationship between ON and BMI values. A study was carried out by Şanlıer et al. to examine the relationship between body perception, depression, food addiction, and BMI values in 793 university students.<sup>[35]</sup> At the end of the study, while there was a positive relationship between food addiction and BMI values of the participants, there was no significant relationship between body perception and BMI values. It is thought that this situation may be due to the difference in the scales used and the age ranges in which the scales

are applied. It does not seem possible to identify all eating disorders with a scale. For this reason, it can be said that studies should be carried out using multicenter and large sample sizes.

This study has some limitations. The physical activity/exercise status of the participants was not questioned in the data collection form. Another limitation is that more detailed tests and/or scales regarding technology addiction and eating disorder and multidisciplinary diagnostic criteria were not applied.

## CONCLUSION

There was no statistical difference between the normal and eating disorder groups according to their technology use. On the other hand, technology addiction and eating disorder were more common among women. According to these results, it was concluded that it would be useful to plan initiatives against technology addiction, especially for women.

## Disclosures

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** There is no conflict of interest.

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**Ethics Committee Approval:** The Clinical Research Ethical Committee of the Yeditepe University approved this study (Approval date: February 28, 2019, and Approval number: 37068608-6100-15-1624). All participants signed the consent form.

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